1 Introduction

1.1 Purpose Of Document

This document is the final deliverable for the first phase of the Western Interoperable Communications Consortium's Interoperable Communications Project. The document was written to show both the process and results of the phase. It contains all information necessary to allow the reader to determine why the project was undertaken, what activities were performed during the project, and what the results of the project were.

Throughout this document, the Western Interoperable Communications Consortium may be referred to as the WICC or "the consortium."

The Northrop Grumman Corporation is pleased to present this to the Board Members of the consortium. It has been our pleasure to work with the consortium members and stakeholders.

1.2 Format Of Document

The document is divided into the following sections:

- Section 1, *Introduction* (this section) provides the reader with information about this document.
- Section 2, *Executive Summary*, provides an overview of the results of this phase of the project.
- Section 3, *Background*, discusses the background for the project, from a historical, statewide perspective, as well as its motivations, goals, and purpose.
- Section 4, *Project Activities*, details the activities which took place during this phase of the project.
- Section 5, *Detailed Results*, contains a record of the results from this project phase.
- Section 6, *Appendices*, contains several appendices with detailed information from the project.

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2 Executive Summary

2.1 Results

In September of 2005, the Western Interoperable Communications Consortium (made up of members from Mineral, Sanders, Ravalli and Lake Counties) contracted with Northrop Grumman to conduct a needs assessment for the Interoperable Communications Project.

This report is the conclusion of this phase of the project and presents findings, recommendations and supporting data. Key to the report and findings is the strategy for moving forward with the project.

Immediate Impact - The needs assessment meetings had immediate impact in almost all locations. Having all of the stakeholders in the same room talking about interoperability got them thinking and allowed them to leave the room and make immediate changes. These changes included activities such as programming additional frequencies into radios to improve interoperability, arranging for memorandums of understanding, frequency planning and formalized communication plans.

Needs assessments statewide have had a similar impact. Focus has been brought to interoperable communication issues, and this focus has generated passionate debates on solutions. Though at times the discussions may be uncomfortable, they bring out valid points for discussion. It is critical that this feedback be considered when designing a new system.

The organizational bodies, from the Statewide Interoperability Executive Council (SIEC), to the Project Directors group have come together to become more effective organizations. Again, this has seemed painful in ways, but it is a critical step in the evolution of the leadership necessary for interoperable communication in the state.

Feedback - The following graph reflects responder priorities for communication improvements consortium wide. Stakeholders are calling for improved coverage, improved business practices, better paging, and improved equipment. During follow up meetings, stakeholders provided further indication that the results shown here are accurate and what they would have expected.

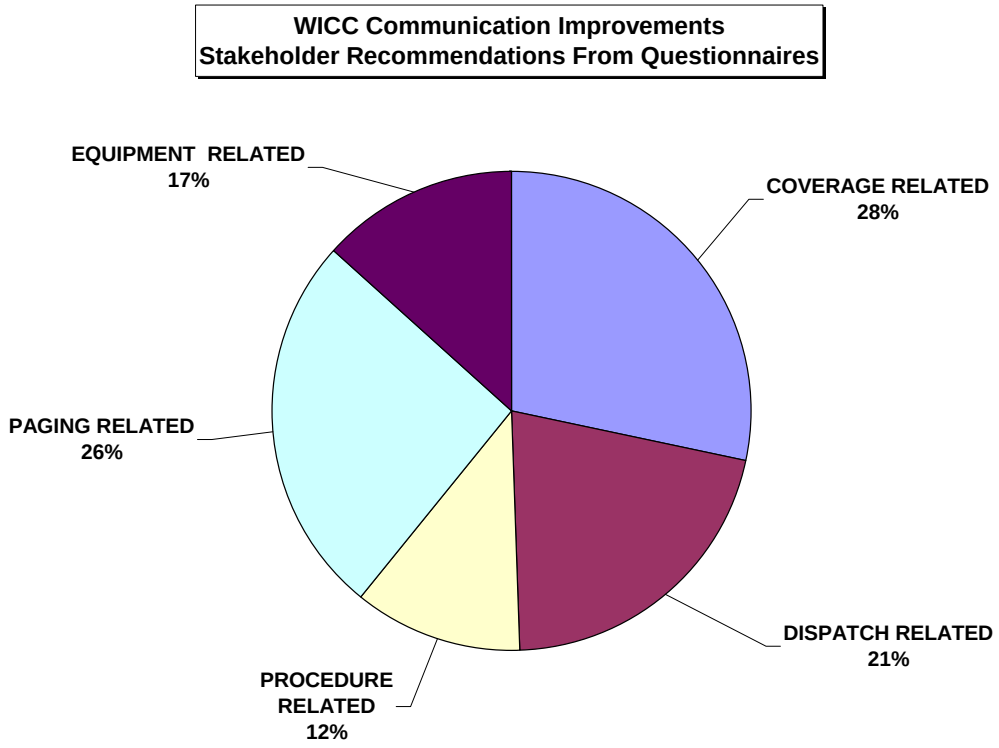

Figure 1 – Communications Improvements - Consortium Wide

2.2 Recommendations and Strategy

The recommendations and strategy described in this document are intended to be in alignment with the SIEC definition of interoperable communication. The exact definition can be found in Appendix I and at the following web site:

http://www.discoveringmontana.com/itsd/policy/councils/SIEC/docs/SIEC_I_O_Def_tech_req.dot

Overall project success depends on the ability to demonstrate success on an iterative basis throughout the life of the project. Project tracking and reporting to show where success has occurred will build support for the project, not only stakeholder support, but also financial support.

Working collaboratively within a consortium and with others throughout the state will bring about the most effective plan, design and implementation of a system, not only for WICC but also for the other consortia and the state/region as a whole.

The following sections of this Executive Summary list the more critical aspects of the project as identified by agencies interviewed.

This section is a high-level summary of recommendations. For additional detail and a full list of recommendations, see section 5.5.

2.2.1 Funding and Resources

It is critical for the success of this project that additional funding and resources be identified and pursued. Funding is near the top of the list of concerns for every agency in the WICC. At the time of this writing, the project has only one revenue source: Department of Emergency Services (DES) or Homeland Security Grants. Additional funds would allow for further work into various steps of the strategy.

There is definite concern throughout the consortium regarding how the available 2005 ODP funding will be allocated. This concern has presented itself with various agencies feeling that they have certain needs that need to be addressed before others in the consortium. This will need to be handled at the consortium board level and will not be easy to manage. Additional funding would make this easier to manage.

It will be beneficial for all to look at this aspect of the project in a different way as it progresses into the next phases. Everyone has something to contribute, not just funding. Some counties or agencies may be able to contribute to site improvements, others may have a great site already, which will contribute to the overall system. Still others may have frequencies or equipment that can be reallocated to benefit another agency. There has been excellent cooperation shown throughout Montana in recent months demonstrating this type of collaboration.

A complete list of known funding sources is listed in section 5.5.1.

2.2.2 Formal Communication Plans

To improve inter-agency communications, it is important for all agencies to establish formal communication plans. Almost all agencies have various neighboring law enforcement, fire and EMS frequencies programmed into their radios now. However, almost no one has a formal communication plan to be able to verify which frequencies have been programmed and which frequencies have not.

Local and inter-county interoperable communications are dependant on each party having the other's frequencies programmed into their radios. This type of coordination is critical for everyone in a region to be able to communicate effectively. It is also important that the collaboration on frequencies be formally documented through a memorandum of understanding.

In particular, it is critical that local and county agencies work with Department of Natural Resources and Conservation (DNRC) and Forest Service to ensure that the local/county agencies have coordinated with the narrow band frequency migration that is underway. WICC should develop conventional frequency plans until a more advance mechanism is available. This plan would include conventional frequencies and mutual aid channels.

This is a scenario that would benefit from a centralized information system, ideally a database. It should be accessible by each agency to coordinate frequencies and radio programming.

2.2.3 Business Process and Training

Business process and dispatch process were identified by stakeholders as areas of priority for a new communications system. As part of the implementation plan, the consortium should make sure that specific training is provided to all levels of radio users on:

- Radios
- Procedures
- Dispatch
- Trunking

2.2.4 Centralized Project and Frequency Management

It is recommended that the following phases, as well as other Interoperable Communication Projects (ICP), be managed through a centralized Project Management Office (PMO). It will be critical to clearly define the role and responsibilities for this entity.

Project management is key to ensuring that site selection and development serves multiple consortia. Centralized project management will provide cost containment and cooperation that will result in lower costs.

Additionally this PMO would be the location for frequency management issues.

2.2.5 Board of Project Directors

The statewide consortium project directors are providing leadership for the statewide effort. This group has demonstrated the ability to come together with a common goal to drive the statewide effort forward.

The Project Directors Board has adopted both a statewide implementation strategy and the concept of statewide project management to move this project forward.

This group needs to continue its work to formalize procedures for how different consortia work together to establish a statewide implementation plan. Collaboration is the key to success and will maximize the benefits from dollars spent.

2.3 Preliminary Design

The system implementation will have to be taken in phases unless a significant revenue source is found. In order to allow for many funding sources, an overall implementation strategy has been devised. This is broken down into two sections: field units and site development.

The implementation strategy is broken down into 3 phases or stages that are based on funding, not time.

Phase 1: Set the Stage - Radios and Site Upgrades
This stage of the project is to ensure that basic standards are met in regard to site conditions and capabilities, which will make sites "microwave ready". It is also the stage for upgrading certain radios, both repeaters and field units.

Phase 2: Add Trunked Sites at each County Seat
The second stage adds microwave and trunking capabilities to sites overlooking counties seats, which are significant population centers, as well as dispatch centers.

Phase 3: Upgrade Additional Sites to Trunking Where Needed
This stage is where the system will go if the consortium has the funding necessary to build out a system that will satisfy the needs of everyone involved.

2.3.1 Field Unit Upgrade Strategy

The recommended strategy for upgrades to field units is based on the Incident Command Systems (ICS) structure. Since the initial funding source is requiring P25 Trunking capable units be purchased with grant funding, it is recommended that command and control level users be provided with new units first. Refer to section 5.6.1 for the details on the recommended upgrade strategy.

2.3.2 Site Upgrade Strategy

Replace or upgrade sites to a certain level of standard that would include:

- Proper grounding
- Tower structural integrity
- Backup power capabilities
- Building capacity and environmentals

Sites upgrade path is selected based on coverage, current fundamental site conditions: power, building, tower, etc. The goal is to select sites that can fit together in a trunked system with overlapping coverage. Other sites will remain conventional based on available funding. The upgrade plan incorporates adding repeaters to the existing system to improve coverage and interoperability in all counties in the consortium.

2.4 Risks

There really are only two factors that present significant risk to the project:

- Lack of funding
- Lack of stakeholder buy-in and commitment

Funding is the key to the project. The Homeland Security Grants are the primary source of funding, but there are many other sources of funding that need to be looked at and tapped into.

Lack of stakeholder buy in is not currently a problem, but it has the potential for high impact if it were to wane. If a good common sense implementation strategy is utilized, then stakeholder buy in will be increased. Keeping the momentum and maintaining the level of interest that has been developed over the past several months is important. This can be done through demonstrated success, small wins, throughout the project.

Some degree of autonomy is relinquished when a shared communications system is implemented and sometimes parochial interests may be an obstacle in establishing a shared system. The system will only be as good as the extent of its acceptance, therefore a strategy to ensure continued communication among all the users is essential through local groups like the radio steering committee while searching for funding.

3 Background

3.1 Historical Perspective – Other Similar Projects And Consortia

Montanans have always had the need for close communication, cooperation, and collaboration between their Law Enforcement and Emergency Responder agencies. The emergency situations the state can and has faced include natural disasters such as forest fires and earthquakes (the most recent large one in 1959 at a magnitude of 7.3), as well as manmade disasters such as the 1996 trail derailment in Alberton Gorge (and subsequent poisonous chlorine gas release) and the 1988 train derailment and explosion in Helena (when it was 30 below zero). In each situation, Montana's Emergency Responders have had to communicate and coordinate in order to react effectively to these emergencies and meet the needs of their citizens. While our emergency responders have always been successful at this, roadblocks have, at times, gotten in the way. Sometimes these roadblocks are technological ("My radio can't talk to your radio") and sometimes they are procedural and political ("That's not our procedure in this situation," or "That's not our policy,").

After the terrorist attacks of September 11, 2001, agencies in these communities and throughout the state and nation have felt an even greater need to develop and maintain plans of cooperation and coordination. Part of this effort has been to work toward the interoperability of the communications equipment used throughout each region and the entire state. Additionally, this effort has included revisiting, renewing, revising, and sometimes creating agreements of understanding and cooperation between the various stakeholder agencies.

Often, the challenges of communications interoperability have been met through "home-grown" efforts, almost on a case-by-case basis. In many cases the interoperability is good. Historically, however, communication problems are almost always listed among the top five problems in post-incident reviews, which suggests that there is room for improvement.

To address and help remedy these situations, various entities within the State of Montana have been formed. The State of Montana began an effort in this regard at the state level several years back. Recently, Lewis & Clark County conducted a successful pilot interoperability project (the Concept Demonstration Project 1, or CDP1) to coordinate services between emergency responders. This project established direction and infrastructure for the county, as well as demonstrated the technology and ability to implement interoperability across agencies – state, local, federal, and private. The Northern Tier Interoperability Consortium (NTIC), which consists of twelve Montana counties and four Indian nations, was formed to deal with these same issues. NTIC initiated the Northern Tier Interoperability Project (NTIP), adopted the same directions and infrastructure decisions made by Lewis & Clark County. Subsequently, the Tri-County Interoperable Consortium (TIC) also made the decision to adopt the directions and decisions already made by Lewis & Clark County and the NTIC. Of equal importance, both projects demonstrated the ability for diverse agencies to cooperate and succeed.

Part of the solution to the problems of interoperability is something called the Project 25 standard. Project 25 (P25) is a set of guidelines developed by radio system users for the purpose of standardizing the method of designing radio telecommunications networks for public safety agencies. Agencies such as the Association of Public Safety Communications Officials (APCO), the National Association of State Telecommunications Directors (NASTD), the Telecommunications Industry Association (TIA), the International Association of Chiefs of Police (IACP), several federal agencies and radio manufacturers have all participated in building this important standard.

Project 25 ensures that all systems following this standard will meet its five main objectives:

1. To make efficient use of the limited number of available public safety frequencies.
2. To permit interoperability among other Project 25-compliant agencies.
3. To ensure backward compatibility of the network.
4. To create smooth system migration via upgrades, additions, etc.
5. To provide the capability for scalable trunked and conventional networks.

3.2 Western Interoperable Communications Consortium By-Laws

ARTICLE I. Objectives

1. The objective of the Western Interoperable Communications Consortium (WICC) as set forth in the establishing Memorandum of Understanding, is to develop an interoperable P25 multimode radio communications system based on federal and state communication standards in which federal, state and local public safety and emergency management representatives can operate autonomously and transition seamlessly to communicate effectively in emergency mission roles. Such a system will provide secure voice and data communications for public safety and improve homeland security through provision of the means by which military and civil authorities may communicate. It will also provide for backwards compatibility during its implementation. This objective will be carried out in three phases. Phase I is a Needs Assessment and Implementation Strategy. Phase II will develop the Implementation Plan, and Phase III will implement the plan. These bylaws are intended to apply to the efforts undertaken by the Consortium.

ARTICLE II. Membership

1. As initially formulated, the Western Interoperable Communications Consortium is made up of Lake, Sanders, Mineral, and Ravalli Counties. Additional members may be included upon the written request by the pertinent Local Emergency Planning Committee (LEPC)/Tribal Emergency Planning Committee (TERC) or the Disaster Planning Committee, or The Board of Commissioners and by acceptance of such request by the Boards of Commissioners.

2. Membership in the WICC Governing Board shall consist of one representative from each member county who will be designated in writing by the Board of Commissioners of that county who will act as the voting representative of that county. An alternate will also be designated to

fulfill the duties of the primary representative in the event of incapacitation or non-availability of the primary representative. Members of the Board shall serve at the pleasure of the Board of Commissioners they represent. The participating counties are full and equal members of the WICC. Each county shall have one vote in proceedings of the Governing Board. Voting by proxy will not be permitted. A quorum shall consist two thirds of members.

3. Since County Commissioners are the only authorized entity that can financially bind the County, a written vote of the Commissioners will be required for all decisions of a financial nature.

ARTICLE III. Meetings and Procedures

1. The Governing Board shall meet initially at least monthly and at the call of any of its members. Meetings and records of meetings shall conform to Title 2, MCA. Notice of the time and place of any meeting shall be given to each member personally, by mail or electronically, as far in advance as possible and include an agenda, but not less than one week before such a meeting whenever possible. In the case of special meetings or postponements of any scheduled meeting, notice shall be given to each member in a similar fashion at least two days before the scheduled date of such a meeting, together with a statement of the reason therefore. Every effort must be made to coordinate meetings so as to provide adequate representation to provide a quorum. Conference calls may constitute a meeting.

2. The Board shall provide for the keeping of attendance rosters and minutes of all meetings of the Governing Board itself and of any committees or sub-committees and shall ensure that minutes/rosters are filed with the records of the Consortium.

3. The Governing Board shall elect one of its members as Chair to serve for such term as the Board may deem appropriate. A vice-Chair shall also be elected to serve in the absence of the Chair. A Secretary shall also be elected for the purpose of taking minutes of all meetings.

4. The Board or the Chair of the Board may invite additional individuals with expertise in a pertinent area to meet with and assist the Board. Such consultants shall not vote or be counted in determining the existence of a quorum.

ARTICLE IV. Organization and Administration

1. The Governing Board of the WICC has the final authority and responsibility for the actions of the Consortium, except as identified in Article II.4. It has, as its primary responsibility, the development of policy to govern Consortium actions. The ultimate goal of such policies is the lawful and effective accomplishment of the initiation of a Memorandum of Understanding and the completion of Phase I, and Phase II of the objectives as set forth herein. The Board is also responsible, through the Chair/Project Director, for overall supervision of the activities and business affairs of the Consortium. The Board is expressly authorized to make delegations of authority and establish committees and sub-committees as may be deemed appropriate to further effect pursuit of organizational goals.

2. The Project Coordinator, as set forth in the MOU between the State Administrative Agency (SAA) and the Consortium, will act as the primary point of contact for the WICC and will, under the direction of the Governing Board, exercise day to day coordination, supervision and administration of the operation of the Consortium.

3. The Project Coordinator will actively seek to coordinate activities of the WICC with the State Interoperability Executive Council and other related activities within Montana and with other agencies and jurisdictions as appropriate to facilitate the goals of the Consortium. The Project Coordinator will be the primary administrative interface with contractors engaged in services for the Consortium and will require progress reports at least monthly from the contractors. In turn, written narrative reports of progress will be made to the SAA as scheduled in the MOU and in addition, the Project Coordinator will keep the SAA informed of significant development as they occur. The Project Coordinator will certify on behalf of the Consortium all invoices for payment by the SAA.

ARTICLE V. Amendment to the By-Laws

These by-laws may be amended or repealed and new bylaws adopted by a majority vote of the Governing Board at any regular or special meeting if at least thirty (30) days written notice of the intention to take such action is delivered to each member of the Board and his or her Board of County Commissioners or Tribal Council.

3.3 Purpose Of The Needs Assessment Phase Of This Project

In general terms, the purpose of the *Needs Assessment* phase is stated in the following paragraph from the WICC's statement of work:

> The purpose of this work is to assess, in detail, the current communication status of all public and private response agencies within WICC and determine steps to be taken to enable the various Counties to develop a strategy to improve interoperable capabilities within their jurisdictions and consistent with current designs of neighboring Counties, Consortia, and States.